

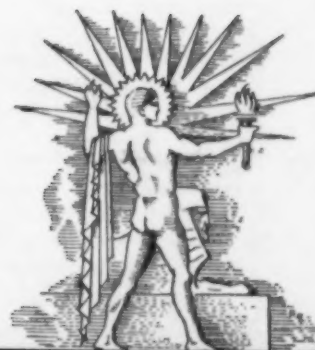
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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



OCTOBER 31, 1931

A Hallowe'en Cat in a Pueblo Bowl

See Page 280

A

SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL. XX

No. 551

The Weekly  Current  
Summary of Science

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## SCIENCE SERVICE

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## DO YOU KNOW THAT

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Albino crocodiles are held in veneration by natives of Nigeria.

The land around the mouth of the Mississippi is as rich as the delta of the Nile.

Coins of many Mediterranean lands found in Egypt show how heavily the ancient world depended on Egypt for food.

More than half of the crippled children in this country owe their condition to infantile paralysis and tuberculosis.

Bermuda, which has always depended on rain for its water supply, is to have a fresh water system, as a result of ingenious engineering.

An English professor has chosen 850 words of "basic English" which provide a vocabulary adequate for ordinary communication, to be used as an auxiliary world language and also for the use of foreigners who find English bewildering.

There are 2,500 varieties of hibiscus in the Hawaiian Islands.

Cotton canvas protected by three coats of paint may be used instead of stucco for upper stories of houses.

California is canning some of her artichoke crop, and thus introducing artichokes into parts of the country not well acquainted with them.

A new European highway runs from Rovaniemi, Finland, on the Arctic Circle, to the shores of the Arctic Ocean, and links with roads and railways in southern Europe.

Tests at the U. S. Bureau of Standards show that a piano action can be constructed which will respond with 1,600 strokes per minute, a speed much faster than any performer can attain.

The daily flow from the 46 hot springs in Hot Springs National Park, Arkansas, is estimated at 850,000 gallons, with an average temperature of 142 degrees Fahrenheit.

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Science Service presents over the radio, an address

## HOW TO AVOID DIGESTIVE DISORDERS

By Dr. William Gerry Morgan, of Washington, D. C., past president of the American Medical Association and Specialist in Internal Medicine

Friday, November 6, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

PHYSICS

# Huge Burning Glass May Give Maximum Sun Heat on Earth

**Temperatures as High as 10,000 Degrees Fahrenheit Are Hoped for Through Use of Multiple-Lens Instrument**

A HUGE "burning glass" made of nineteen lenses each two feet in diameter, as well as nineteen smaller ones, will soon be in operation at Pasadena at the new Astrophysical Laboratory of the California Institute of Technology. With its aid, it is hoped, temperatures as high as those in the sun-spots, around 10,000 degrees Fahrenheit, will be attained, and astronomers will be able to study at close range how various substances behave when so heated.

The new instrument has been developed by Dr. John A. Anderson, of the Mt. Wilson Observatory, who originated the general design of the lenses, and Russell W. Porter, who worked out the practical details of a mounting for the instrument, so that it can follow the sun as it moves across the sky. The sun's light and heat fall first on the nineteen two-foot lenses, which by themselves would bring the rays to a focus at points twelve feet away. A set of eighteen mirrors reflects each beam to the center, where it meets the other beams. Before reaching the center, however, each beam passes through a smaller lens, seven inches in diameter, which concentrates it still further. The beam from the center two-foot lens passes directly into the second lens without reflection from a mirror.

## Size of Little Fingernail

At first, the large beam of sunlight which supplies the whole battery of lenses is ten feet in diameter, but at the final focus of the instrument it is reduced to an area the size of one's little fingernail, so that the energy is concentrated about 200,000 times. The material to be studied will be placed in an evacuated glass bulb, made large enough not to be melted by the intense heat. As the material vaporizes under the temperature—and no substance is known which will withstand it—it will give off light, which will pass into an adjacent dark room, where it can be analyzed by powerful spectroscopes.

The erection of the new astrophysical

laboratory, of which the solar furnace will be part, is one of the steps in a new program being undertaken at the California Institute of Technology, in studying the phenomena that occur in the heavens. The 200-inch telescope, double the size of any existing at present, which is now under construction, is part of the same program.

*Science News Letter, October 31, 1931*

ARCHAEOLOGY

# Prehistoric Cave Culture Proves Mystery to Scientists

BONES of twelve prehistoric Indians—and a dog—who lived in an Arkansas cave and were buried in a cave when they died, have been unearthed, and science finds itself faced by a new problem in American identities.

The cave dwellers do not appear to have been just like the prehistoric Pueblos of the Southwest, nor like the ancient Basket Makers who lived even before the Pueblos. Nor yet do the cave dwellers resemble the prehistoric Bluff Dwellers who took shelter under the overhanging bluffs of the Ozark hill country, nor are the cave dwellers like any other "type" of prehistoric Indian culture.

Winslow M. Walker of the Bureau of American Ethnology, who found the cave and its inhabitants in the Buffalo River region of Arkansas, says: "It seems to be simply an early cave culture. There is no way of dating it. It is prehistoric, that is all we can say now."

The twelve burials which Mr. Walker unearthed in the cave represent a strange assortment. There was an old man, a middle-aged man and woman, and the rest were babies. Some unknown agent of destruction, perhaps famine or disease, took heavy toll of the babies at one time. All of the skeletons were buried in a flexed position, knees close to



MODEL

*Of the instrument which it is hoped will concentrate the sun's power 200,000 times.*

chin, arms bent and held close to the body. Near one child lay the skeleton of a dog. The dog was accorded a proper burial, like his master, by having feet tied together and the head bent forward.

It is by studying the possessions of the people that Mr. Walker finds them "different." That is to say, the articles are so simple that they have little individuality. Everyday tools and weapons were of bone, stone, and shell. The crudity of the articles betokens a very low degree of culture. Many flint spearheads, arrowheads, and knives were buried in the cave. The pottery which the cave dwellers used for cooking and eating purposes was crudely fashioned. No basketry or any woven stuff was in evidence, and to the archaeologist this is one of the strangest features of the cave, for the Bluff Dwellers who lived nearest to these cave dwellers used many baskets.

The most puzzling object from the cave is a small piece of antler with a notch in it. This may be a piece of an atlatl, or dart thrower, one of the important weapons used by Southwestern tribes in early times. The Indian hunter would insert a dart in the atlatl notch. When he hurled the atlatl forward over his shoulder, the dart left the notch and



sped forward with greater force than if it had been thrown by ordinary methods. If the notched bone found in the Arkansas cave is not an atlatl, it may have been a needle for making nets, Mr. Walker says, though the absence of any fragments of net in the cave makes it uncertain that these people used nets. At present the evidence is not sufficient to allow of a definite verdict.

The types of tools and weapons used

by different Indian groups were distinctive, and it is by studying closely the objects at a prehistoric site that archaeologists are able to trace the migrations of ancient tribes and the blending of cultures and the influence of one upon another. Mr. Walker expects to return to the Arkansas cave country next summer to add to his evidence of this new, unidentified group of ancient Americans.

*Science News Letter, October 31, 1931*

#### VOLCANOLOGY

## Sulphur to be Taken from Crater of Mexican Volcano

**F**OR the first time in twenty years negotiations are going forward for the privilege of taking sulphur out of the crater of Mexico's quiescent volcano, Popocatepetl, for commercial purposes. American interests are reported involved in the project.

The last important concession obtained from Mexican authorities for this purpose was granted during the administration of Porfirio Diaz and was held by his friend, General Gaspar Ochoa. Ochoa's operations were halted because of the revolution which broke out in 1910.

In the past the sulphur has been hauled up to the top of the crater in a large basket, which was accomplished by means of a rope and pulley. Usually it is carried from the crater to Tlmacas down the mountainside on the backs of Indians. Burros have been the means used to transport the sulphur, which is in the form of brimstone, from Tlmacas.

It has been found necessary to grant Indians working in the actual crater two days' leave between each two days of work, because of the stifling sulphur fumes. The crater is three-quarters of a mile wide and approximately five hundred feet deep. In the center is a small, emerald-green lake.

The brimstone which collects about the crater periodically catches fire. Only the surface of the brimstone burns, however. So-called eruptions of Popocatepetl within recent years have been proved by expeditions from the National University of Mexico to be nothing more than enormous amounts of smoke from the burning brimstone.

Sulphur has been taken intermittently from Popocatepetl since the time of the

ancient Aztecs, who used it for medicinal purposes. Two of Cortez' soldiers, in the sixteenth century, climbed to the crater and obtained sulphur for the purpose of manufacturing gunpowder.

*Science News Letter, October 31, 1931*

#### DENTISTRY

## Eat Rather than Brush To Develop Sound Teeth

**T**HE GREATER importance of food over cleanliness in prevention of tooth decay and the responsibility of the physician rather than the dentist for proper tooth formation were stressed by Dr. Edward Clay Mitchell of Memphis at the meeting there of the American Dental Association.

"Although we do not wish to discourage proper mouth hygiene, yet it has been definitely shown that a properly fed tooth will not become carious even in a dirty mouth," Dr. Mitchell said.

"The physician is equally if not more responsible than the dentist for proper tooth formation," he continued. "Teeth require feeding the same as any other structure in the body. It is the physician who must teach the mother to watch her own and later her baby's diet in order to insure healthy teeth for the child. Plenty of sunshine and a well-balanced diet, including milk, egg yolk, fresh vegetables, fruit juices and cod liver oil are needed by every infant. Early attention to these factors will result in much better teeth for the next generation, Dr. Mitchell observed.

Care of the teeth may be compared to care of a motor car, because a well-built dental organ has functions that resemble those of any machine, Dr. E. Melville Quinby of Boston pointed out at the same session.

A car to be efficient must be strongly built to stand stress; must have its units in alignment for smooth working; and must be cleaned and lubricated to prevent rusting or destruction. The factors to be stressed in the dental machine are therefore nutrition; occlusion, which is the contact of the teeth when the jaws are closed; and mouth hygiene. Dr. Quinby suggested the slogan: Balanced diet, clean mouths and better dental machines for everyone.

*Science News Letter, October 31, 1931*

The inheritance of harelip in mice has been studied by two scientists.



—Photo by courtesy of Baltimore and Ohio Railroad Co.

### THREE GENERATIONS OF BRIDGES

At historic Harper's Ferry, W. Va., stands a remarkable trio of bridges. The three illustrate the evolution of bridge construction as well as reflect the changes in railroad operation. Each of the bridges was built at a widely different time during a period of ninety-four years. Farthest back in the picture is the oldest bridge, originally built in 1836 with wooden arches, subjected to raids of both Confederate and Federal troops during the Civil War, and permanently replaced in iron. The bridge in the middle of the group went into operation in 1894 to take care of increased traffic. Foreground shows the modern creation, wrought in steel.

## ARCHAEOLOGY

# Grotesque Figure Dug Up at Olynthus Shakes Art Theory

Discovery Shows Early Greek Art was Not all Beauty, Revealing Existence of Distinct Flair for Caricature

THE TERRACOTTA figurine of a squat, grotesque little man has been dug up in the Greek city of Olynthus, in Macedonia, and it bids fair to cause more disturbance to theories of classical art than many a piece of truly beautiful sculpture.

The "funny man" was found by Dr. David M. Robinson, of the Johns Hopkins University, who excavated at the ruins of Olynthus this past summer. The clay figure is pronounced by him to be evidence that early Greek art was not all beauty and idealism, as histories of art proclaim. Instead, there was a distinct flair for caricature among the Greeks of Olynthus, whose skillful fingers were shaping statuettes back in the fourth century B. C. and earlier.

## Not the Only Caricature

The funny man with his straggly beard and broad mouth and flat nose is not the only caricature unearthed at Olynthus. Negro heads which are caricature types have also been found. Caricatures have heretofore been supposed to belong exclusively to a later period of Greek art.

Little terracotta figures of women in graceful poses are also among the art treasures newly recovered from the Macedonian city. Some of these figurines were in the ruins of houses. From the number, it appears that the Olynthians were partial to statuary art in their homes, and after death had these house ornaments placed in their tombs. Many of the clay statuettes have also been unearthed in the city's cemeteries, of which Dr. Robinson discovered two, one near the river which he calls Riverside Cemetery and the other one-half a mile to the east. Dr. Robinson explains that it was customary among the Greeks to provide art objects for the pleasure of the dead in the future world.

Traces of paint may still be seen on the faces and costumes of many of the little figures. One of these is a dancing girl, swaying in a step that was fashionable 2,300 years ago. Her hair is red. Her eyes are black. And her lips are

still scarlet. Dr. Robinson calls this dancing lady one of the most graceful figurines ever found in Greece.

In contrast to the dancer's lightly poised figure is another red-haired lady, who is depicted stiffly seated with hands in her lap. This figure of rigid dignity, perhaps a goddess, is a relic of an earlier, more archaic art period than the dancer.

The terracotta figures are the first important collection of such things to be obtained from Macedonia. They show that Olynthus, a northern Greek city, had a flourishing industry and art in baked clay wares from about 600 B. C. down to the day when the city was destroyed in war, 348 B. C. A terracotta factory was found by Dr. Robinson at Olynthus during a previous expedition in 1928. Moulds for shaping figurines have also been found this year, one of a horse and another of a lion's head. Many of the terracottas are of local

## GENETICS

# Tendency to One Sex May Be Hereditary in Families

IF THE CHILDREN in your family are all or nearly all of one sex, it may be because of a hereditary tendency toward maleness or femaleness handed down from your ancestors. At least such is the conclusion of Dr. Raymond R. Willoughby of Clark University as a result of a study of the heredity charts of 71 members of the freshman class at that institution, reported in the current issue of *Human Biology*. He found that the men in the class were members of predominantly male families, although the women came from families where most of the children were girls.

Dr. Willoughby found almost no relation in this group between intelligence and the tendency of the members of the family to have large numbers of



A GREEK "FUNNY MAN"

This is the little statue which is expected to be the subject of much controversy.

Macedonian clay which has mica in it. Others were imported from Attica and Boeotia.

The figures from Olynthus illustrate the development of this type of art from archaic to advanced style. They are, says Dr. Robinson, a little history of Greek art in themselves.

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children. There was, however, an extremely slight tendency for the more intelligent to belong to the less productive families. Nevertheless, he found that the great majority of families producing college men are much more than maintaining their numbers.

Men may feel cheered by another finding of Dr. Willoughby's—that there is a direct relation between intelligence and the proportion of men to women in the family.

Dr. Willoughby warns that these conclusions cannot be considered as definitely established until similar studies are made on far larger groups. He believes them to be very significant, however.

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CHEMISTRY

# Predicting Undiscovered Elements

Part One

## "A Classic of Science"

### Ekaboron and Ekaluminium are Scandium and Gallium; Mendelyev Lived to See His Predictions Verified

*THE NATURAL SYSTEM OF ELEMENTS AND ITS USE FOR THE PREDICTION OF PROPERTIES OF THE UNDISCOVERED ELEMENTS. By D. Mendelyev, in Journal of the Russian Chemical Society, Vol. 3. St. Petersburg, 1871. Translated for the Science News Letter by Taisia Stadnichenko.*

THE differences in value of the atomic weights of neighboring elements represent a gradual change in which we can follow their periodicity. This gives us the possibility of theoretical correction of the atomic weights of those elements which were determined with insufficient accuracy at first. This and some other conclusions based on the proposed system of elements forms the subject of my former contribution. I now want to clarify further some of the conclusions in regard to the properties, chemical as well as physical, of those elements which are lacking in the system and have not yet been discovered, but whose discovery is very probable. I think that heretofore there has been no possibility of foreseeing the absence of this, or that element because we had no rigid system of elements and even more we had no reason to predict the properties of such elements. With the indications of the periodic and "atomological" relationships between the atomic weight and the properties of all the elements it becomes possible not only to show the absence of some of them but also to determine with greater certainty and positiveness the properties of the at present unknown elements. We can now state their atomic weights, their density in the free state or in the form of oxides, their acidity or alkalinity, their degree of oxidation, their capacities for reduction and the formation of double salts, indicating the properties of the metallo-organic compounds and chlorides of the given elements, and we are even able to describe in considerable detail the properties of some of the

compounds of these unknown elements. I have the courage to do this because, at some time in the future, when one of the bodies predicted by me is discovered, I shall have the chance finally to assure myself and to make other chemists believe in the correctness of those propositions which lie at the root of the system proposed by me. Personally I have been thoroughly convinced of the theory since the suppositions for Indium, based on the periodic relationship that underlies all of this research, have been confirmed. . . .

#### Third Group Elements Lacking

In the list of ordinary elements, the absence of a large number of analogues of boron and aluminium is most striking, that is, elements that belong to the third group. The lack of an element from this group that ought to follow aluminium and ought to be found in the second series, following potassium and calcium, is quite evident. Since the atomic weight of the latter is close to 40, and since in this series we have an element of the fourth group, Titanium,  $Ti = 50$ , then the absent element must have an atomic weight of about 45. Due to the fact that this element belongs to the even series, it must show more basic properties than the lower elements of the third group, *i. e.*, boron and aluminium. Its oxide  $R_2O_3$  must be more strongly basic. This can be proven by the fact that the oxide of titanium,  $TiO_2$  has the properties of a very weak acid and also possesses many properties that are distinctly basic. However, the basic properties of this metal must be quite weak, because the basic properties of titanium are so weak; in comparison with aluminium oxide, this oxide will have a more basic character and therefore it will not form with alkalis a stable compound which is not decomposable with water, but with acids it will form stable salts. At any rate, it will not be soluble in ammonium, but it is possible that its

hydroxide will be slightly soluble in potassium hydroxide, although this is uncertain at present, due to the fact that this element belongs to the second series and to the group of elements whose oxides contain a small amount of oxygen.

I propose to call this element ekaboron, deriving the name from the fact that it follows boron as the first element of the even group, and a prefix eka- from sanskrit meaning "one."  $Eb = 45$ . Ekaboron in the free state would be a metal with atomic volume of about 15, because in this series of elements as in all even series the atomic volume diminishes rapidly in transition from the first group to the following one. Thus the volume of potassium is close to 50, of calcium to 25, of titanium and vanadium to 9, of chromium, molybdenum and iron to 7. The specific weight of this metal must be close to 3 because its atomic weight is 45. This metal will not be volatile, because all the metals of the even series in all groups (except I) are not volatile. Therefore it is not likely that it will be discovered by the ordinary method of spectral analysis. It will not decompose water at ordinary temperatures, but will decompose it at a slightly elevated temperature, similarly to other metals in this region, and a basic oxide will be formed as a result. It will dissolve, of course, in acids, and the chloride  $EbCl_3$  (maybe  $Eb_2Cl_6$ ) will be volatile, but salt-like, because it corresponds to the basic oxide. Water will affect it in the way it affects chlorine compounds of calcium and magnesium, *i. e.*, ekabor chloride will form hygroscopic substances which will give HCl with water, but will have no chloranhydride character. Since the

#### Ekasilicon

was the third element whose properties were predicted in detail by

#### MENDELYEV

It will complete this  
CLASSIC OF SCIENCE  
Next Week



volume of  $\text{CaCl}_2$  is 49, and  $\text{TiCl}_4$  is 109, the volume of Ekabor chloride must be near 78, and consequently its specific weight will be close to 2.

The oxides of Ekaboron,  $\text{Eb}_2\text{O}_3$ , must be non-volatile, and possibly non-fusible, and insoluble in water, because even the oxide of calcium is only slightly soluble in water, but it will be soluble in acids. The specific volume of the oxide of Ekaboron must be close to 39, because in this series  $\text{K}_2\text{O}$  has a volume of 35,  $\text{CaO}$  of 18,  $\text{TiO}$  of 29 and  $\text{CrO}_3$  of 36. That is, with a content of one atom of oxygen the volumes at first rapidly decrease and then slightly increase, as can be seen from the following: volume of  $\text{K} = 35$ ,  $\text{Ca} = 18$ ,  $\text{Ti} = 10$ ,  $\text{Cr} = 12$ , therefore the volume for the oxide of Eb with a content for one equivalent of oxygen ought to be about 13. Consequently the formula  $\text{Eb}_2\text{O}_3$  must correspond to a volume of about 39, and therefore the oxide of Eb in the dehydrated state will have a specific gravity of approximately 3.5. Being a rather active base, this oxide must show a slight tendency to the formation of alum, although it is possible that it will form alum-like compounds, that is, double salts with potassium sulphate. Ekaboron, of course, will not form metallo-organic compounds. From analogy with the elements of the even series, judging from the data at hand on the elements accompanying cerium, not one of them could fill the place of Ekaboron. Therefore this metal almost certainly does not belong to the number of satellites of cerium known at present.

#### Ekaluminium

This cannot be said of the remaining elements of the third group in the even series, because their equivalents nearly approach those which should be possessed by the following unknown members of this group. In this group the element in the third series following zinc is lacking. Its atomic weight must be close to 68. We will call this element Ekaluminium,  $\text{El} = 68$ , because it follows directly after aluminium in the third group. In distinction from Eb, it must possess the ability to form metallo-organic compounds, and because of its position between aluminium and indium it must have properties close to those two elements. Consequently it will form alums. Its hydroxide will be soluble in a water solution of potassium hydroxide. Its salts will be more stable than the salts of aluminium, thus Ekaluminium chloride will be more

stable than aluminium chloride. Its atomic volume, based on consideration of the same characters as were applied in determination of the properties of Ekaboron, must be close to 11.5, hence the specific weight in the metallic state will be near 6.0. The properties of this metal in all respects must represent the transition from the properties of aluminium to the properties of indium. It is very likely that the metal will possess greater volatility than aluminium and therefore we may hope that it will be discovered by spectro-investigation in the way indium and thallium following it have been discovered, although it will be less volatile than either of them and therefore we must not expect such striking spectral phenomena as led to the discovery of the latter. Most probably this element also does not belong to the number of cerium's satellites, although its equivalent approaches the equivalent of Yttrium. But it has not the form of oxide typical of Yttrium with the molecular formula  $\text{RO}$ , nor do the distinct basic properties of its oxide permit us to consider Yttrium as belonging to this place in the system of elements: instead the next place, in the third



DMITRI MENDELYEV

(or Mendeleef), the Russian chemist who discovered the Periodic Law governing relationships between the chemical elements.

series, position III-4, belongs to Yttrium. . . .

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#### MEDICINE

## Machine Outdoes Physician In Detecting Artery Hardening

A SPECIAL machine which can determine the presence of hardening of the arteries when a physician cannot determine it by ordinary tests was demonstrated for the first time at the Graduate Fortnight of the New York Academy of Medicine.

This and other new instruments for diagnosing heart disease are included in the exhibit which is a special feature of this year's Graduate Fortnight. More than 2,500 physicians from all over the United States and from Canada and England are attending the Fortnight to learn the latest developments in the diagnosis and treatment of heart disease and disorders of the circulation.

The exhibit covers almost every known fact pertaining to the circulatory system, according to the director, Dr. Louis Gross, pathologist of Mount Sinai Hospital.

Another machine on exhibit automatically registers the heart beats of a patient undergoing an operation. This

enables the physician or his assistant to tell just what condition the patient's heart is in without stopping to take the pulse or listen to the heart with a stethoscope.

Dr. Maude E. S. Abbott of McGill University and Dr. John L. Bremer of Harvard Medical School have arranged a special exhibit of hearts which traces the growth of the organ in the embryo. In addition, Dr. Abbott has an exhibit which displays all the known forms of congenital heart disease. In this display are hearts of persons who lived despite the fact that they had holes where heart muscle should be and despite the fact that they lacked an entire heart valve or the aorta, main blood vessel from which all the arteries rise.

Motion pictures showing the heart valves in action and showing studies under the microscope of the first heart beat of the embryo are other interesting features of the exhibit.

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## HYDROGRAPHY

**Bottle Race Shows Speed Of Lake Michigan Currents**

**A** BOTTLE traveling ten miles a day in the water was the winner of a long-distance swim for bottles staged in Lake Michigan last summer by the U. S. Bureau of Fisheries. During the summer the steamer Fulmar, operated by the Fisheries Bureau, released 283 bottles in the lake, in an endeavor to determine the various surface tendencies of that important body of water. To make the investigation a success, it was necessary to depend upon the courtesy of the various bottle-finders in complying with a note inside asking that the bottle be returned to the Bureau's office at Ann Arbor with information as to the date and place where found.

The winner of the bottle race, released at St. Joseph, Michigan, was found 20 days later at Sleeping Bear Point in Leelanau County, 200 miles away.

The information thus being gathered concerning the currents of Lake Michigan will be of value to commercial fishermen along the lake as well as to navigation.

*Science News Letter, October 31, 1931*

## ARCHAEOLOGY

**Cats Were Wild in Ancient Southwest**

See Front Cover

**I**N ANCIENT America it was bad luck to meet a cat on a dark night. All the cats that the Indians knew were wildcats. Dogs were tamed, and learned to follow Indian hunters and Indian children around, but cats walked by themselves very wild and lone.

The Indian pottery bowl on the cover is from the collection in the American Museum of Natural History. The bowl is adorned by a fine big cat such as Pueblo Indians knew. Kitty's teeth are set for a me-yowl or a bite. Her eye has the alert look of a Hallowe'en cat, all witching and eerie. The long, up-curving tail is a danger signal, a fitting accompaniment to kitty's alert expression. Judging by that tail, this cat was a puma or an ocelot, not a bob-cat.

The cat inside the bowl was painted by some unknown Indian woman of the Mimbres Valley, New Mexico, hundreds of years ago. In most Pueblo tribes, the women were good at shaping clay into dishes and tall containers. In many tribes it was customary to decorate the outer or inner surfaces of pottery with

attractive designs. Our cover-picture cat is not merely a lively portrait, but is artistically posed to make a pleasing design in the bowl.

The hole in the center of the bowl—and the cat—was not made by any irate Indian, expecting to stop some neighbor cat's yowling by the sympathetic magic of plugging a painted feline. The hole was knocked in the bowl in order to "kill" it at the burial of a Mimbres Indian. It was a custom among some Pueblo tribes to lay a painted bowl over the head in a burial, and a hole was made in it so that the spirit of the bowl might escape.

The Mimbres Indians are one of the Pueblo tribes that vanished, mysteriously, before white men came into the Southwest. So nobody knows how the Mimbres Indians would have explained the wanderings of the spirits. But perhaps on frosty autumn nights the spirit of this painted cat went roaming the Mimbres Valley, hundreds of years ago.

*Science News Letter, October 31, 1931*

## ORNITHOLOGY

**Birds Make Debut in Talking Motion Pictures**

**B**IRDS broke into the talkies when Arthur R. Brand, of Cornell University, presented before the meeting of the American Ornithologists' Union a film, "illustrated" with sound, of a number of singing birds which he had successfully stalked with motion picture camera and sound recorder. This was a climax of a great display of bird movies, showing a total of nearly six miles of film before the largest gathering of American and Canadian ornithologists that has ever been assembled in one place.

*Science News Letter, October 31, 1931*

## PSYCHOLOGY

**Violin Music Arouses Fear and Rage in Wolves**

**T**HE AGE-OLD belief that the music of a violin would drive the wolves away was borne out recently at the London Zoological Gardens.

Wild wolves from Europe and Asia shook and trembled and put their tails between their legs at the sound of an invisible violin played behind their cages. When at last the violinist stepped in view of their cages still making music, fear turned to anger and the wolves lunged at their bars.

*Science News Letter, October 31, 1931*

**IN SCIENCE**

## ENGINEERING

**Michael Pupin Receives Engineers' Highest Award**

**T**HE HIGHEST honor of the American engineering profession, the John Fritz Gold Medal, has been awarded for 1932 to Dr. Michael I. Pupin of Columbia University for his achievements as "scientist, engineer, author, and inventor of the tuning of oscillating circuits and the loading of telephone circuits by inductance coils," it is announced by the Medal Board of Award.

Dr. Pupin, who was born in Serbia in 1858 and came to this country as a poor immigrant boy, has won for himself a place as one of the country's most famous scientists and inventors. The story of his life has become widely known as the result of the publication of an autobiography, "From Immigrant to Inventor." Dr. Pupin's placing of inductance coils at intervals along a telephone line greatly extended the range of long distance telephony.

The John Fritz Medal is awarded by four of the largest national societies of engineers.

*Science News Letter, October 31, 1931*

## PHYSIOLOGY

**Fluorine Proved Cause Of Dogs' Mottled Teeth**

**D**OGS with mottled teeth, an endemic condition of the enamel produced by the presence of fluorine in drinking water, have been achieved experimentally by Dr. Margaret Cammack Smith of the Home Economics Department at the University of Arizona.

Six months ago, Dr. Smith completed her experiments with the drinking water at St. David, Arizona, and determined that fluorine in the drinking water at that place was responsible for the existence of mottled teeth.

At first the mottled condition was only produced experimentally in white rats, but now for the first time this condition has been given to the larger animals. The mottled condition has been produced after a six months' feeding experiment.

*Science News Letter, October 31, 1931*



# ANCE FIELDS

## CHEMISTRY

## Unusual Kind of Vinegar Made from Coffee Berry

**R**ED VINEGAR that looks like clear Rhine-wine, smells like pear oil, and tastes like old whiskey, comes from the pulp of the coffee-berry. About forty per cent. of the berry is bright red pulp, nine per cent. of that sugar and eight per cent. tannins, F. W. Reise, chemist, says. Unripe mash made from the pulp contains acid, while over-ripe mash develops methanol from pectin. By-products have had little utilization. Coffee is the twin-seed of a cherry-like berry that grows on a bush.

*Science News Letter, October 31, 1931*

## PHYSIOLOGY

## Life-Saving Cortin Relieves Nervous Diseases

**C**ORTIN, life-saving extract of the cortex of the adrenal glands, has been found to have an effect on the nervous system, Prof. Frank A. Hartman and Dr. Gilbert Beck of the University of Buffalo reported to the Central Neuro-Psychiatric Association meeting at Buffalo.

Dr. Hartman is one of a number of investigators who recently prepared this glandular hormone. It has prolonged life in patients suffering from once fatal Addison's disease and in animals that have suffered damage to or loss of the adrenal glands. In these cases the extract supplied the vital hormone which was lost when the glands became damaged or diseased.

An entirely new aspect of the function of cortin has been opened by Dr. Hartman's latest investigations.

"In studying the influence of cortin in Addison's disease we have noted rather striking effects in certain of the nervous manifestations," he reported. "This stimulated us to investigate the effect of this substance on definite neurological diseases."

"In some diseases where there is muscular wasting certain symptoms are improved. Insomnia may be replaced by restful sleep; depression by a sense of well-being. Subjective sensations

such as aches and pains diminish or disappear; fatigue is reduced. Cortin, however, is in no sense a cure for these conditions but seems merely to afford temporary relief," Dr. Hartman emphasized.

Cortin seems to be important for the proper function of the nervous system, for Dr. Hartman found that the nervous system is quickly fatigued in animals which lack this substance.

The reflexes of a normal animal will continue to work for several hours before fatigue stops them. The reflexes of an animal that has had its adrenal glands entirely removed are fatigued in a few minutes upon continued use. This would account for the ready fatigue which occurs in adrenal insufficiency, Dr. Hartman suggested.

*Science News Letter, October 31, 1931*

## PUBLIC HEALTH

## TB and Pneumonia Wreak Most Havoc Among Indians

**I**F THE DEATH rate from tuberculosis and pneumonia can be materially lowered among Indians, the most serious checks to increase of the aboriginal population will have been removed," Dr. Forrest Clements of the department of anthropology of the University of Oklahoma concludes on the basis of a study of mortality figures for the Mohave and Chemehevi Indians at the Colorado River Indian Agency as compared with the U. S. Census Bureau statistics for whites, negroes, and Indians. A full report of his study appears in the current issue of *Human Biology*.

Despite a birth rate very much higher than that for the whites, the future of the Indian population is greatly endangered by these two diseases, Dr. Clements points out. For an extremely large proportion of the Indians die during childhood and early youth. Only slightly more than half the Indian girls, 53 per cent., live to reach the age of 20; only 38 per cent. live to be 40 years old.

"It is obvious that each Indian woman who survives through her reproductive period will have to produce more children on the average than will white or negro women, in order to maintain the population," Dr. Clements says.

The popular opinion that the Indian attains great longevity is termed by Dr. Clements a myth. "Actually both negroes and whites, especially the latter, are longer lived," he says.

*Science News Letter, October 31, 1931*

## PSYCHOLOGY

## Unspanked Children Not Necessarily Delinquent

**S**PARING the rod does not always spoil the child, and, conversely, a great amount of corporal punishment will not keep some children from straying into delinquency and crime, it appears from an investigation conducted by Dr. Mabel F. Martin, a psychologist of West Springfield, Mass.

Two contrasting groups were selected by Dr. Martin for study to determine the effects of punishment on the conscientiousness of the individual. One was a group of delinquent boys committed by the courts to the State Home at Jamesburg, N. J., among whom "tender consciences and sensitive honor were notably lacking." The other group was of girls at Mt. Holyoke College who were "chiefly concerned about work to be accomplished, responsibilities to be discharged, and obligations to be met," Dr. Martin says.

In no case did lack of punishment in earlier childhood appear as a contributing cause of the delinquency of the boys, Dr. Martin found. Often it was the fear of punishment that had driven the boy into vagrancy and eventually into jail.

In the case of the conscientious college girls, on the other hand, punishment in childhood does not appear to have played an important role. Nearly half fail to mention it at all in an account of their childhood; a few specify that they were never punished; and an equal number say that they were seldom punished, Dr. Martin said.

*Science News Letter, October 31, 1931*

## ANTHROPOLOGY

## Classics of Anthropology To Be Published in Czech

**T**HE CLASSICAL documents of anthropology, from Aristotle down to modern times, are to be published in monograph form in the Czech language, by a new organization in Prague. Such a work has never before been undertaken in any language. The first publication, bringing together all the scattered scientific writings of Aristotle on the subject of man as such, has already appeared, and it is expected that others will follow in rapid succession.

Dr. Ales Hrdlicka, anthropologist of the U. S. National Museum, is one of the founders of the new organization.

*Science News Letter, October 31, 1931*

## PSYCHOLOGY

# Are You Grown Up?

**You May Be More Than Twenty-One Years Old, But You are Not Really an Adult Unless You are Emotionally Mature**

By JANE STAFFORD

**A**RE you grown up? If you are twenty-one years old you probably think you are. But are you sure? How can you tell?

Twenty-one is the legal age for stepping over into adulthood, of course. Biologically you became an adult, fully grown and mature, by the time you celebrated your twenty-fifth birthday. Psychologically, you were grown up as soon as the intelligence tests rated you at a mental age of sixteen.

Even if you have passed all these ages, however, you are not really grown up unless you are emotionally mature.

You probably know people who seem childish in their emotions; women who burst into tears when things go wrong, or men who fly into a rage whenever they do not get their own way.

However, there are less obvious signs of emotional immaturity. A New York psychologist, Dr. Frankwood E. Williams, has drawn up a list of them in his recently published book, "Adolescence." Check yourself by them to see if you are really grown up. You might check some of your friends and relatives, too, or your boss.

To begin with, are you afraid to ask for a raise? This is one of Dr. Williams' signs of people who do not have grown up feelings.

Do you believe, if you are a woman, that your husband is never given a square deal by his boss? The chances are that he is. If you believe he is not, you show one sign of emotional immaturity.

Is your boss the kind of executive who "wants what he wants when he wants it?" Next time he exhibits this trait, it may help you to remember that the psychiatrist would find he had not grown up emotionally.

Is your husband more devoted to his mother than to you? Many women suffer with this sort of a husband, but probably few of them realize that their husband's attitude is a sign of not having grown up. Such husbands have not matured emotionally. Their affections are still on a childish level. Some psy-

chiatrists would say that these husbands are suffering from the Oedipus complex.

The condition gets its name from the figure in Greek mythology, Oedipus, who married his mother. Oedipus did not know what he was doing, as he had been kidnapped in infancy and neither he nor his mother recognized each other when they met years later. Oedipus' father, the king, had died and the city was in the hands of an unfriendly power. The kingdom and the hand of the widowed queen were offered to the man who would deliver the city from this unfriendly power. Oedipus saved the city and unwittingly married his mother, according to the legend.

## Insidious Oedipus

Modern men who suffer from the Oedipus complex do not know what is the matter with them any more than Oedipus of the legend knew he was marrying his mother. They do not realize that they have not outgrown the stage when love for mother is the supreme affection of a boy's life.

Do you know anyone who is always sending telegrams when there is time for a letter? It is done rather freely by undergraduates in colleges, but when men and women older than college age do it, they are showing that they have not grown up beyond the college age in their emotions, Dr. Williams would say.

Near the beginning of his list come unmarried men and women. This is hard on the bachelors and spinsters of the crowd. Usually these very unmarried people seem anything but childish. It may surprise you to learn that the mature and sophisticated bachelor, always in demand at social gatherings, may not be grown up emotionally in spite of his air of worldly wisdom.

The modern, independent bachelor girl with her own apartment and her important job, and even the old maid of an earlier generation, have often appeared more grown up than their young married friends who looked and acted not much older than their own babies. But these bachelor girls may not be emotionally mature.

You can probably recall a number of

famous personages of history who never married. Queen Elizabeth, England's virgin queen, for instance, refused all her suitors and preferred to remain single. She was 70 years old when she died and she has gone down in history as being a shrewd and able sovereign. Would you say that her remaining unmarried was a sign of her not having grown up emotionally? There have been many explanations of her refusal to marry. It may be that this one comes nearest the truth. Her behavior was peculiar at times and her boisterousness has often been described as being a sign of a masculine nature. Possibly it was only a reflection of the childish level of her emotions.

Of course, being unmarried is not necessarily a sign of emotional immaturity, Dr. Williams explained. But the burden of proving that he is grown up is upon the unmarried person, he says.

Other people who show signs of not having grown up emotionally are the men "who must love many women briefly and find it difficult or impossible to love one for any length of time." Don Juan, famous character of fiction, is the classic example of this kind of man. In the present age of easy divorces, a good many people are exhibit-



**QUEEN ELIZABETH**

*England's virgin queen, was 70 years old when she died. Her remaining unmarried may have been a sign that she was emotionally immature.*

ing this characteristic. DeWolf Hopper is almost as well known for his many marriages as for his ability as an actor. This may be a sign that he has not grown up emotionally, or there may be extenuating circumstances.

Then there are the men and women who are greatly concerned over the salvation, one kind or another, of other people. The professional reformers and soul-savers, from the late Anthony Comstock to Aimee Semple McPherson and Billy Sunday, are no more than children, emotionally, according to the psychologist's standards.

Do you know a man whose wife does not understand him? Whether she understands him or not, you can understand him all the better when you realize that he is not really grown up emotionally, no matter how many birthdays he has had.

Ever so many people are living beyond their income for one reason or another. You may have friends whom you suspect of doing so. You doubtless think it is a bad thing from an economic standpoint, but have you ever considered that they do it because they are not grown up emotionally? Yet Dr. Williams says that people "living on Park Avenue on a Greenwich Village income" show one of the less obvious signs of emotional immaturity.

When you are at your office, do you ever say or feel that your desk must be clean by night? If you do, and the task is self-imposed, you are showing that you have not yet grown up emotionally, according to Dr. Williams.

Some of the other people on Dr. Williams' list are:

"Parents embarrassed by sex questions of their children.

"Men and women shy and self-conscious in the presence of each other.

"Individuals who force sex in one form or another unnecessarily to the fore.

"Physicians with a bedside or consultation manner.

"Social workers who wear out shoe leather rather than brain cells.

"Women who do not believe that women are inferior to men but who feel so and act as though they were."

The cartoonist who draws politicians as kneepants, mischievous school boys is not far wrong. In fact, he is a good psychologist, according to Dr. Williams' theories. Many people who hold positions of public trust and are much respected for their intellectual attainments have not grown up emotionally. This is unfortunate for all of us, because when people who are not grown up

## Ask Yourself These Questions To Find Out Your Real Age

Are You Married?

Does Your Wife Misunderstand You?

Are You Afraid to Ask for a Raise?

Do You Send Telegrams When a Letter Would Do?

Are You Fickle in Your Affection?

Do You Always Want to Save other People?

Are You Embarrassed by Questions of Your Children?

Do You Live Above Your Income?

have to struggle with grown-up problems, they get into trouble and make trouble for others.

"There would seem to be no question that most of the ills we suffer from are man-made and not superhumanly inflicted, and that they come about through the emotional immaturity of people who have to wrestle with problems that are beyond their capacity even to understand, let alone to handle satisfactorily," said Dr. Williams.

### Infantile Patterns

"The fact that men and women in high places as well as the average run of men and women in their daily decisions and relationships to others frequently merely reassert infantile and childish emotional patterns, is an important fact," he continued.

"We shall come to recognize," he prophesied, "that this business man, this school teacher, this judge of an important court, this publisher, this reformer, is an adult in years, has an adult physical development and a keen intellect, but emotionally lives the life of an adolescent, or of a child, or even of an infant.

"As the possibility of this situation comes to be generally recognized and these individuals to be identified, I am inclined to think that we shall be less patient with their judgments, that we shall not follow so blindly their decisions and leadership."

Such people have reached physical

adulthood and have unusually keen intellects. They could be very useful individuals, Dr. Williams points out. But their decisions in important matters are not made in accordance with the facts but in the light of the unsolved emotional problems of their own personal childhood. They act honestly enough, but they see the facts not as they truly are but distorted through these personal lenses. They cause difficulty and confusion. Their keen intellects make it possible for them to defend ably their improper decisions and their weak causes. They could easily solve many of the problems brought to them, if such people did not get the problems for solution mixed with their own personal problems which have nothing to do with the issue at hand. Therefore these people hinder rather than help, Dr. Williams finds. The fact that their high order of intellect has brought them to prominence and power in the community only makes them greater disturbers. The world needs these people, but it can only use them after they have grown up.

Sometimes you get exasperated by these people with the childish emotions and feel like telling them to grow up. The slang expression, "Be your age," was probably inspired by just such a grown-up person who had the feelings and emotional reactions of a child.

But these people cannot grow up just because you ask them to. It is not so simple as that. They cannot press a



button or turn on a tap somewhere in their brains or bodies and suddenly become mature.

"Efforts of this kind," said Dr. Williams, commenting on misguided attempts to grow up, "usually end in a situation just as childish and more deceptive because more sophisticated. One decides to grow up by ceasing to be prejudiced and ends merely in becoming heatedly prejudiced against prejudice."

As a matter of fact, no one is really mature, Dr. Williams finds. Some people have gained a relative maturity.

You may be wondering what emotional maturity really is. The list you have been checking yourself against is

rather negative, as it gives only signs of immaturity. Maybe you did not find yourself there at all. Here is what Dr. Williams has drawn up as a tentative standard of emotional maturity:

"An adult is (1) one who is able to see objects, persons, acts (realities) in the terms of what they are, cleaned of all infantile symbolic investments; (2) one who is under no compulsion either to do or not to do, but who is free to act or not to act in accordance with the realities of any given situation; and (3) one who is able to adjust to an inalterable situation with a minimum of conflict."

*Science News Letter, October 31, 1931*

#### ARCHAEOLOGY

## Ancient Indians Introduced Building of Houses in Row

**T**HE FASHION of building houses in a row with a party wall between was introduced into America, not by city planners, but by Indians of the Southwest, almost 2,000 years ago. This is one of the discoveries made by Dr. F. H. H. Roberts, Jr., of the Bureau of American Ethnology, who has been excavating at Indian ruins near Allentown, Ariz., for several months. Four students from the Laboratory of Anthropology, at Santa Fe, assisted Dr. Roberts in the expedition, which has just finished its work.

The site of the old settlement is a flat mesa. A pueblo stood there about 1000 A.D., as the ruins show. On three sides of the pueblo walls, and probably buried beneath them, are remains of pit houses built by earlier Indians who chose the mesa top for their homes.

In one place he found three adjoining houses in a row. A fire had swept the "block." The flames caused the entire roof of one house to fall in, and then, fortunately for archaeological research, the fire retreated, leaving the mass of charred timber, bark, and earth on the floor, so that the modern archaeologist can tell exactly how the roof of one of these old buildings was constructed.

Dr. Roberts restored this house to its original appearance, and visitors to the ruin can now see one of the oldest "row houses" in America. The two adjoining houses have been protected by sheds.

The pit house which has been restored consists of a foundation dug out to a

depth of five or six feet and then covered by roof beams of timber, thatched with bark and coated over with earth. The house is roughly circular, about 15 feet across. From the outside such a house looks like a hump of earth, except for the ventilator hole in the top of the hump and another hole which was the entrance and which sometimes had a ladder projecting from it.

#### Dates on Timbers

Some of the charred timbers from the pit houses have been sent to Dr. A. E. Douglass, of the University of Arizona, who first succeeded in dating Southwestern ruins by tree rings. Dr. Douglass' verdict as to the dates on the pit house timbers will show in precisely what years the houses were built.

Some of the pit houses which Dr. Roberts excavated belong to the earliest Pueblo period. But there are several houses which show signs of having been built and occupied even earlier by the Basket Makers.

Dr. Roberts and his assistants unearthed some of the skeletons of the Pueblos who lived at the site, and also some of the earlier Basket Makers. The two types are distinguished, not only by objects that accompany them, but also by head shape. The Pueblos had broad skulls, and they exaggerated the broadness by flattening the head in infancy. The Basket Makers were long-headed and did not have any fashion of deforming the head.

*Science News Letter, October 31, 1931*

#### PHYSIOLOGY

## Swinging Children by Arms May be Cause of Paralysis

**S**WINGING children around by the arms should be taboo in every household, no matter how eagerly the children beg for this form of fun, warned Dr. Dwight F. Clark of Northwestern University Medical School at a conference of physicians at the Evanston Hospital, Evanston, Ill.

The nerves of the arm of a little child are too exposed at the neck and the armpits to be subjected to any unusual stretching, he said. Children have been known to suffer serious and sometimes permanent injury, including paralysis of the arm, when grown-ups, usually fathers, pick them up and swing them by the arms or with the fingers hooked in the armpits with the best intentions in the world of being playful.

The effects of slight injuries to the nerves are usually immediate, but may not show up until some time after the damage has been done and the circumstance forgotten. That is the reason, in Dr. Clark's opinion, that surgeons in many cases fail to discover the true cause for the paralyzed or partially paralyzed arms that come eventually to their attention.

The nerves running from the neck down through the arm are so arranged that at the point of union of the various branches (known as the brachial plexus) the cords are peculiarly exposed at the armpit. An overstretching or division of the fibers may lead to the interruption of the nervous current supplying the arm or may rupture one of the numerous blood vessels winding about the nerves. In either case, the arm may become useless even though no external injury is visible.

The experience of surgeons indicates that such cases may require operation if neglected, or may even prove incurable. However, if cared for in time, they can be restored to normal use through comparatively simple measures.

The recommended treatment is to consult a competent surgeon who will immobilize the arm in such position as will place overstretched and injured parts at rest, control impending internal hemorrhage and relieve pain. Sensation usually begins to return, sometimes within a day or two, and even in cases where loss of motion has been complete the function may be restored to normal in a space of ten days and the danger of permanent disability averted.

*Science News Letter, October 31, 1931*

CHEMISTRY

# Discovery of Element 87 Reported by Cornell Chemists

## X-Ray Examination of Complex Mineral Reveals Presence Of Substance to be Known Temporarily as "Eka-Caesium"

THE DISCOVERY of element 87, one of the two remaining missing or "doubtful" members of the chemist's periodic table, is reported in the mineral "samarskite," by Prof. Jacob Papish and Eugene Wainer of the department of chemistry of Cornell University, who used X-rays to examine it.

A discovery of element 87, one of the 92 ultimate building blocks of the material world, was announced a year ago in the minerals "lepidolite" and "pollucite" by Prof. Fred Allison and Dr. Edgar J. Murphy of the Alabama Polytechnic Institute. The Cornell researchers doubt this claim. They have examined solutions reported by Prof. Allison to contain number 87 but decided that it is present, if at all, in extremely small quantity.

### "Magneto-optic" Method

Prof. Allison used a novel method of examination devised by himself, called the "magneto-optic" method. The reliability of this has not yet been tested by other investigators. The X-ray spectrum used by Prof. Papish and Mr. Wainer, on the other hand, is widely known to scientists and was successfully used in 1926 at the University of Illinois to identify America's first element Illinium, number 61, for the first time. In the hands of competent investigators it is a powerful way of detecting an element.

Prof. Papish and Mr. Wainer decided to examine the very complex mineral "samarskite," by means of the X-ray spectrograph. "Samarskite" is a curious department-store kind of a mineral containing uranium, tantalum, cerium, columbium and smaller amounts of many other elements.

Cornell chemists can base their claim to priority in this discovery, if they are successful, on the additional fact that they chemically concentrated the preparation in which they claim to have found this elusive element. This was not done by Prof. Allison.

A large quantity of the mineral was heated in a stream of hydrogen chloride gas and a mixture of chlorides of metals driven off. The distillate, after conver-

sion into sulphates was purified by various chemical processes and finally fractionally crystallized as the alum salts of the mixture of the alkali metals.

The least soluble alum obtained, which was rich in the alkali metal caesium, the nearest family relative of 87, was then subjected to tests in the X-ray spectrograph. Five lines agreeing perfectly with those to be expected from the missing number 87 were found on the photograph. The basis of this test is that each chemical element gives characteristic lines on the X-ray spectrogram, whose position enables the physicist to tell its atomic number, or place in the series of elements.

The findings have been submitted to the American Chemical Society and published in its journal. The researches were supported by grants from the Heckscher Foundation for the Advancement of Research at Cornell University.

The authors believe that they have established the presence of the missing element in samarskite. However, they state:

"A name for the element will not be announced until additional confirmatory data are obtained."

### Neighbor to Radium

Number 87 has been called "eka-caesium" because of its close relationship to caesium. It is the next door neighbor to radium in the periodic classification and should be similar in properties to sodium and potassium, the so-called alkali metals. The behavior of the Cornell samarskite extract agrees with this requirement.

There are 92 elements in the chemist's periodic classification of the elements. About only two of these, numbers 85 and 87, is there any doubt as to their nature and occurrence.

The further concentration of the mixture in which number 87 has been found will be watched with great interest by the scientific world. Several previous claims of the discovery of 87 have been disproved by later experi-



PROF. JACOB PAPISH  
Co-discoverer of "Eka-Caesium."

ments. The properties of the element should be of great interest.

*Science News Letter, October 31, 1931*

ENGINEERING

## Navy's New Airship Hangar Will be Built in Sections

THE NAVY'S new airship hangar at Sunnyvale, Calif., final contracts for which have just been awarded by the Navy Department, will have the same general shape as the one at Akron, but it will "stretch" differently.

The Akron hangar is held fast at a point about the middle of the structure, allowing the ends to expand outward in hot weather. At Sunnyvale, however, according to naval engineers, the hangar will be split up into a middle and two end sections with expansion joints between them. Provision is made at these joints for two arches, set four feet apart and entirely unconnected, which will enable each section to do its stretching independently.

Work on the new hangar will begin immediately, the foundations and grading to be finished within six months, and the hangar proper to be completed about March, 1933. The hangar will be about three city blocks long, two blocks wide, and it will have a height equivalent to 18 stories. But in spite of its immensity, it will be smaller than the hangar at Akron.

*Science News Letter, October 31, 1931*

## PHYSICS

# New Theory Would Explain Cosmos' Unexpected Ways

A NEW theory which may explain why the physical world sometimes behaves unexpectedly has been outlined by Prof. G. N. Lewis of the University of California. The new system is called generalized thermodynamics.

The science of thermodynamics, which has been so powerful in explaining large classes of physical phenomena, is inadequate in that it does not include those fluctuations from the condition of balance that actually occur in the world. Prof. Lewis has attempted to bring the known facts about fluctuations and the general laws of thermodynamics into one scheme.

Prof. Lewis is well known as one of the most important thinkers on the fundamentals of science, and though it is impossible at present to say what value

the new theory has, scientists will study with interest this latest contribution to a basic question.

Thermodynamics is the science of the broad relations between physical quantities which does not require any special knowledge as to how substances are made up of atoms.

## First Valid Statement

The second law of thermodynamics, which tells us that the world is becoming more and more mixed up as time goes on, has been given a new formulation by Prof. Lewis in his paper. He claims that his is the first really valid statement of the law that will stand examination in the light of unexpected happenings which sometimes appear. Those unforeseen fluctuations, though

regular to a certain degree, are nevertheless at variance with the regularities of thermodynamics.

Thermodynamics tells us that a system of physical bodies isolated from others will steadily change towards a unique condition of balance or equilibrium. In point of fact the final condition is one in which the balance oscillates between states near the true balance. These fluctuations from the theoretical balance are such that ordinary thermodynamics cannot inform us of them. Some time ago Prof. Albert Einstein combined the first approximation given by thermodynamics with the Boltzman probability theorem and thus obtained a first solution of the problem.

Prof. Lewis has now carried the question a step further.

He expresses the crucial point of his new discovery as follows: "All the laws of thermodynamics and of fluctuations may be shown to follow from a single cardinal postulate, which is essentially the following: If a given amount of some quantity such as energy or any form of matter is allowed to distribute itself between two systems, so that by one observation we find a certain fraction of the total amount in the first system, and again, after a long time by a second observation we find a slightly different fraction, and so on until the statistical rules governing the observations have been ascertained—then these rules are independent of the mode of communication between the two systems."

*Science News Letter, October 31, 1931*

## PHYSIOLOGY

## Insects Better Than Rats For Use in Vitamin Tests

INSECTS are better subjects for use in vitamin tests than are the conventional white rats and other larger laboratory animals. This is the claim of Dr. M. D. Sweetman and Prof. L. S. Palmer of the University of Minnesota, who have been trying out various foods on the larvae of a species of flour beetle.

They gauge the insects' reaction to a given diet by the time elapsing between their emergence from the egg and the end-point of larva-hood, when they become chrysalis or pupae. Besides the obvious advantages the insects offer, in economy of space and rapidity of multiplication, they are also far more sensitive in their reactions to low concentrations of certain vitamins, the two Minnesota scientists state.

*Science News Letter, October 31, 1931*

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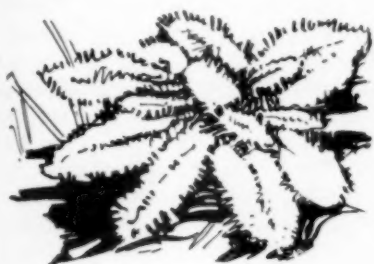
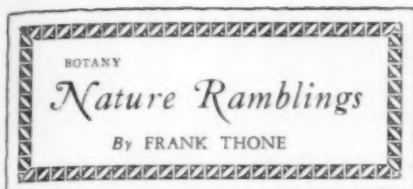
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Winter Rosettes

**P**LANTS have a double problem to face in regions, misnamed "temperate," where there is an alteration between a tropic summer and an arctic winter. During the growing season their task is to become as tall as possible, reaching upward toward the sun for the vital rays indispensable to food-making. During the winter the job is to keep away from exposure to sleet and frost and from the arid cold winds and too sudden thaws. The winter task is by far the more difficult, and annual plants sidestep it altogether by dying and entrusting the future of their several species to weatherproof seeds. Tougher woody plants either shed their leaves or reduce them to mere needles, and store next year's vegetative parts inside buds protected with jackets of varnished scales. Perennial herbs simply hide underground.

A fourth solution of the winter problem is presented by the so-called rosette plants, such as dandelion, mullein and wild lettuce. These plants are usually biennials, starting from seed during the summer, wintering over as flat circles of leaves on the ground, and in spring enjoying a considerable start over their annual neighbors, which have to begin from seeds, and over the perennial herbs, which have to come up from beneath the ground. The rosettes hug the ground so closely that they receive shelter from the first half-inch of snow that falls, or from the first few chance leaves. They are thus about as well off, so far as protection goes, as the varnished buds of trees, and they are there, already unrolled and ready for business, while other plants are struggling to get out of their wrappers.

*Science News Letter, October 31, 1931*

## PHYSIOLOGY

## Special Capillaries Protect Extremities Against Frostbite

**D**ISCOVERY of a mechanism which protects the toes, fingers, ears and similar extremities of the body against frostbite and injury due to extreme falls in temperature was made public by Sir Thomas Lewis, editor of the British medical publication, *Heart*, at the Graduate Fortnight of the New York Academy of Medicine.

This mechanism is concerned with a hitherto unknown function of the special capillaries found only in the portions of the body affected by cold, according to Sir Thomas' announcement.

These special capillaries are direct connecting vessels between the smallest arteries and the smallest veins of the fingers, toes and similar parts of the body. They were discovered more than ten years ago, but have remained in comparative obscurity because their function was not known. They are distinct from the well-known capillaries of the circulatory system and seem to have a different structure. For instance, the special capillaries have muscles, which the ordinary capillaries lack.

The nerves of the special capillaries, microscopic in size, act entirely independently so as to cause the flow of blood necessary to raise the temperature of the fingers or toes and so protect them against the cold, Sir Thomas explained. By means of a nerve reflex arc the stimuli are transmitted from the cold

finger or toe to the tiny vessels whose muscles expand to admit large amounts of warm blood to flow through the chilled exposed parts.

Sir Thomas produced evidence to prove that the nerve fibers of these special capillaries in the finger tips will produce a heating effect even when the nerve trunks connecting the fibers to the spinal cord and brain have been cut.

"The action," he said, "is independent of the sympathetic nervous system and is dependent upon the sensory nerves in the skin of the fingers."

### Five Years' Research

The discovery of this mechanism for protecting fingers and toes against frostbite is the result of five years of research by Sir Thomas Lewis and his colleagues of the University College Hospital Medical School, London. It was undertaken to explain why temperature rises in a finger or toe when exposed to snow or cold and no similar rise occurs in unexposed extremities.

*Science News Letter, October 31, 1931*

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# • First Glances at New Books

## Astronomy

**THE STARS FOR SAM**—W. Maxwell Reed—*Harcourt, Brace*, 190 p., \$3. Nobody who knows Mr. Reed's *The Earth for Sam* will need any argument at all to send them to their bookdealers with an order for his present venture into the heavens. It is written with a special eye to the unappeasable appetite for new knowledge that one finds in bright youngsters in their mid-teens. It is aimed squarely at their heads, not over them; yet it avoids the fatal error of seeming to be "written down." Although written for young readers, it does not flinch from such tough assignments as island universes, quanta, and relativity.

*Science News Letter, October 31, 1931*

## Hygiene

**THE SCIENCE OF HUMAN LIVING**—Mae Johnson Corwin and Walling Corwin—*Harr Wagner*, 464 p., \$1.68. One of the attractive "Corwin Science Series" for seventh, eighth, and ninth grades. This volume is more comprehensive than the usual school book on health education. It is really a text on personal well-being, and includes lessons on better homes, mental health, safety, food, and clothing, all handled from up-to-date viewpoint.

*Science News Letter, October 31, 1931*

## Physical Sciences

**THE SCIENCE OF DISCOVERY AND INVENTION**—Walling Corwin and Mae Johnson Corwin—*Harr Wagner*, 735 p., \$1.80. Another of the Corwin series of school books on science. This one deals with chemistry, physics, astronomy, and geology. The authors have not shied away from chemical formulae. In astronomy they use such terms as "sidereal period of revolution." They discuss combustion engines and facts about climate. The book will fascinate the scientifically inclined boy entering his teens. Other pupils of that age may find it a bit difficult unless the teacher is skillful in steering the course. But the young student who masters the book will know something about science.

*Science News Letter, October 31, 1931*

## Biology

**THE SCIENCE OF PLANT AND ANIMAL LIFE**—Mae Johnson Corwin and Walling Corwin—*Harr Wagner*, 592 p., \$1.72. To give the student a more thorough understanding of living things, introducing him to the world of

plants and animals and to the problems and principles of agronomy, these aims are carefully carried out in this very thorough junior high school text. The book, like the two described in preceding reviews, is in the "Corwin Science Series."

*Science News Letter, October 31, 1931*

## Archaeology

**ANCIENT AMERICANS**—Emily C. Davis—*Holt*, 311 p., \$3.50. There have been many books, some of them good ones, about special aspects of American archaeology, such as the great Incan culture of the Andes or the Maya ruins in Yucatan; but curiously enough until now there has been no single work covering the whole bewilderingly varied Indian world as it was in pre-Columbian days. Miss Davis has therefore done both the general public and archaeology itself a real service in getting us out from among the trees and letting us see the forest. The Indians emerge from this book with considerable credit, as stewards of a great estate who within the frame of their inherent abilities made good increase of the fund with which they had been intrusted. Miss Davis has the happy ability to pack her book closely with facts without losing the leaven of easy readability. The illustrations are well chosen and their liaison with the text is good. There is an excellent index.

*Science News Letter, October 31, 1931*

## Biology-Philosophy

**THE PHILOSOPHICAL BASIS OF BIOLOGY**—J. S. Haldane—*Doubleday Doran*, 155 p., \$2. A printing of the Donnellan Lectures at the University of Dublin in 1930. Prof. Haldane attacks scientific materialism heavily, comes out flatfooted for the organismal or holistic approach to the phenomena of life, finds a place for God in a struggling world.

*Science News Letter, October 31, 1931*

## Ethnology

**SERPENT WORSHIP IN AFRICA**—Wilfrid D. Hambly—*Field Museum*, 85 p., 8 pl., 75c. Besides describing regional beliefs and customs dealing with serpent worship, Dr. Hambly also cites for comparison facts regarding serpent worship in other parts of the world. The explanatory passages telling why the serpent is so important in folklore are an especially interesting feature of the monograph.

*Science News Letter, October 31, 1931*

## Botany

**LEAVES FROM GERARD'S HERBALL**—Arranged by Marcus Woodward—*Houghton Mifflin*, 305 p., \$3. It is a wonder that Gerard's *Historie of Plantes* has never gone through the thousand-fold editions that have been the happy lot of Izaak Walton, for Gerard's combination of lucid language and curious conceits is certainly on a par with that of the Great Piscator. Perhaps this neglect of the centuries will be remedied now; for Marcus Woodward's selection of text and illustrations, combined with the excellent typographic job the publishers have made of the book, should attract hosts of readers who have never pluck'd a flower, just as Izaak's charm has won many who have never catch'd a fish.

*Science News Letter, October 31, 1931*

## Genetics-Evolution

**MENDELISM AND EVOLUTION**—E. B. Ford—*Dial*, 116 p., \$1.50. A closely reasoned inquiry into the modern aspects of evolution, presenting Mendelian arrangements of mutations as the material on which natural selection operates.

*Science News Letter, October 31, 1931*

## Geology

**THE BIOGRAPHY OF MOTHER EARTH**—Henry Smith Williams—*McBride*, 315 p., \$5. This author goes the limit with the continental drift idea. He starts with all the lands of the earth massed around the South Pole, and drifts them northward, and round and round at the same time. For him the coal fields of Spitzbergen are evidence that that land mass once migrated through the tropics. The book is lavishly illustrated, but the pictures are rather fuzzy.

*Science News Letter, October 31, 1931*

## Chemistry

**USEFUL INFORMATION ABOUT LEAD**—*Lead Industries Association*—104 p., 50c. Ubiquitous and indispensable lead and its compounds are the subject of this new and educative style of publicity. Lead is one of the oldest metals known to man.

*Science News Letter, October 31, 1931*

## General Science

**A STUDENT'S LABORATORY GUIDE AND PROJECT BOOK IN GENERAL SCIENCE**—M. C. Collister and E. L. Thurston—*Iroquois Publ. Co.*, 144 p., 76c. Intended for high school use.

*Science News Letter, October 31, 1931*